

Section Three: Decontamination

 Estimated
Contact
Time:
45 minutes

This module covers:

...decontamination, the critical first step in maintaining infection control. Decontamination is the process of cleaning and disinfecting medical supplies and equipment. Based on the premise that all items are contaminated and potentially infectious, the decontamination process plays a vital role in interrupting the transmission of infectious disease. In this module you will learn about: the purpose of decontamination, the procedures and equipment used, collection and transportation requirements, and the role of decontamination in infection control.

Following instruction, you should be able to perform the following:

- ☒ Identify the purpose of decontamination.
- ☒ Detail infection control procedures that are necessary in the decontamination process.
 - Identify Personal Protection Equipment.
 - Identify guidelines for safely handling sharps.
 - Identify hand-washing requirements.
 - Identify procedures for handling spills, soiled laundry and infectious waste.
- ☒ Detail collection and transportation requirements.
- ☒ Identify decontamination equipment, procedures, and precautions.
 - Identify equipment.
 - Detail equipment purpose.
 - Describe equipment operating procedures.
 - List precautions/exclusions for each piece of equipment.

Why is Decontamination Important?

One of the primary concerns of a medical facility is infection control. The medical center staff must follow specific precautionary steps to minimize the spread of pathogens from one patient to another. Supplies, instrumentation, and equipment must be clean and/or sterile, and the procedures for collecting, processing, and handling them must be designed to control the spread of the microbes that can cause infection and disease.

Decontamination is the process of decontaminating or purging medical devices of fluid and debris that might harbor living organisms. By cleaning and disinfecting the surface of medical devices, you reduce the bioburden, decreasing the chance that microorganisms will find a place to live and grow. Devices cannot be sterilized unless the bioburden is low enough for the sterilization agent to come in contact with all surfaces and kill the microorganisms.

By eliminating pathogens from the surface of medical devices, decontamination plays a vital role in interrupting the transmission of infectious disease.

The decontamination area must be separated from the rest of SPD in order to isolate soiled items during processing. To work in this area you must be trained in the specific processing methods.

Decontamination Area Requirements

The decontamination area is specifically designed to meet the medical center's needs for the processing of supplies and equipment.

- It is a restricted area and should be physically separated from the rest of the SPD areas.
- The area must have adequate lighting to allow for inspection of articles during processing.
- Ventilation must be under negative pressure, allowing air to be pulled from areas outside of decontamination. This reduces cross contamination into surrounding areas.

- Wall, ceiling, and floor surfaces must be designed to withstand daily cleaning with a disinfectant to reduce the bioburden or microorganism count in the area.
- Transportation of supplies and equipment to decontamination must be in impervious bags, impervious covered/closed carts, cart lifts, dumbwaiters, and automated transport systems.
- Work flow should originate from outside the decontamination area and travel inside through a dedicated entry way and/or dumbwaiter/lift system. Articles are then processed and passed through to the clean side for further preparation and redistribution.
- The area must allow direct access to user areas, such as surgery and the wards, so that contaminated materials can be quickly and efficiently transferred. The longer material remains dirty, the more opportunities there are for cross contamination.

Protective Equipment

Personal protective equipment (PPE) is essential to an SPD technician's safety. As a technician, it is your responsibility to understand the policies and procedures regarding protective attire in each work area or job assignment. It is the medical center's responsibility to provide healthcare workers with PPE and training to promote personal safety.



Reference: <http://www.cdc.gov/ncidod/hip/isolat/isopart2.htm>

Since the introduction of Universal Precaution/Standards, all used equipment and supplies must be treated as if they are contaminated. Protective attire must be donned before entering the decontamination area. Ideally, an area immediately outside the decontamination area should be available for this purpose.

The type of PPE used in SPD includes:

- surgical scrub suits
- surgical hair covers

- impervious gown
- impervious shoe covers
- face mask and goggles or face shield, designated decontamination gloves (not exam gloves)
- Additional protective items include plastic aprons and ear protection. (Ear protection may be necessary when some equipment is in use.)

Personal protective equipment must be stored outside of the decontamination area, donned before entering, worn at all times in the decontamination area and removed whenever you leave the area. After removing protective wear, you must wash your hands. A shower is highly recommended at the completion of duties in decontamination. A fresh set of protective wear must be donned before reentering the decontamination room. Regular laundering and/or disinfection of all reusable personal protective equipment is required to reduce cross contamination. PPE should be stored in an area away from contaminated equipment.



Head/hair cover

A non-impervious bouffant hat must be worn to contain hair and cover the top and sides of the head. Workers with facial hair should also wear a face mask or full face shield.



Glasses/goggles/face shield

A reusable face shield, which covers from ear-to-ear and below the chin, is the preferred protection against splashing liquids. Goggles and a surgical mask are acceptable substitutes. Goggles and shields should be cleaned regularly.



Decontamination gloves

Decontamination or high-risk gloves must be worn. They may be reusable, but must be assigned to the individual employee, who is responsible for keeping them cleaned. Gloves must be long enough to come up over the cuff of the gown. (*Do not wear surgeon's or exam gloves under the decontamination glove. Cloth liners are available for those who are allergic to the glove material.)



Gown

A long-sleeved, fluid-impervious gown or jumpsuit is required. It should cover from neck to knees and may be disposable or reusable. It must be worn properly and tied.



Shoe cover

Shoe covers must be fluid-impervious and reach to mid-calf.

PPE for collecting contaminated materials is designed to protect you and others that you may come in contact with.



Cover Gown

A cover gown is a long-sleeved, fluid-repellant garment (which may be open in the back), used to protect the uniform from soil. The cover gown must be removed when pick-up duties are complete.



Exam Gloves

Exam gloves are to be donned prior to handling any contaminated items or containers. They must be changed after each pickup in each separate ward or floor location. To avoid contaminating surfaces in public areas, gloves should not be worn while transporting contaminated items back to the decontamination area.

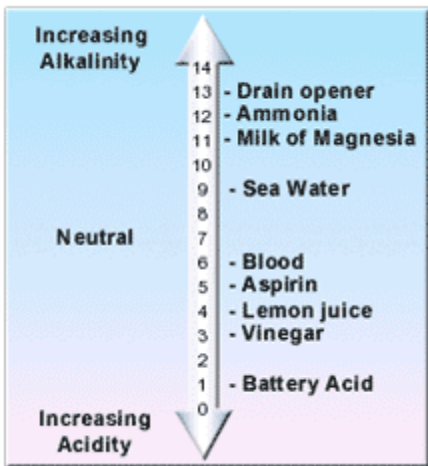
Detergents and Disinfectants

Detergents and disinfectants are the chemical agents used in manual and mechanical processing of instruments and equipment. Proper use of these agents helps reduce the number of microorganisms to a level that makes items safer to handle. A disinfectant or detergent should always be used for what it is intended. If used properly, the solution will perform effectively. As an SPD technician, you are responsible for knowing the types of detergents and disinfectants available for use and the manufacturer's instructions for using them. Make sure you have reviewed the Material Safety Data Sheet (MSDS) for any chemical

before you use it. Misuse could cause harm to both you and the patient.

Detergents

Detergents are used to aid in the removal of soil such as blood, pus, bone fragments, and urine from the surface of instruments or equipment. Soil gives microorganisms a place to live and colonize (grow in numbers). Instrumentation and equipment that is not properly cleaned will continue to harbor microorganisms and may impede the disinfection and/or sterilization process.



Detergents are selected based on their pH level. Ph is a measure of how acidic or alkaline a substance is.

- A level of 7.0 is neutral.
- Any pH level below 7.0 is acidic. For example, blood, vinegar, and lemon juice are highly acidic. Acidic detergents can lead to rust and corrosion of instruments.
- Any pH level above 7.0 is alkaline. Most detergents and soaps are alkaline compounds.

The pH scale is logarithmic. That means that each mark on the scale represents a tenfold change. For example, lemon juice is ten times more acidic than vinegar. And battery acid is one hundred times more acidic than vinegar (10X10).

Did you know?

The pH abbreviation stands for “Potential of Hydrogen” or how likely a substance is to give up hydrogen atoms when mixed with water.

Detergents are used in both manual and mechanical decontamination processes. They can be used with:

- Ultrasonic
- Pasteurmatic washer
- Cart washer
- Washer/sanitizer
- Washer/sterilizer

- Manual processing/presoaking of instruments

Disinfectants

Disinfectants are substances that inhibit/destroy the growth of pathogenic microorganisms. They may have little or no effect on bacterial spores. Disinfectants can be classified as high-, medium-, or low-level, according to their ability to kill microorganisms.

Type:	Kills:	Appropriate for:	Examples:
High Level	all bacteria, viruses, and fungi, but not bacterial spores.	items that may have come into contact with body tissue. also as an appropriate means of disinfecting items that come in contact with mucous membranes (respiratory devices, laryngoscope blades, EGD, colonoscopes).	chlorine dioxide, hydrogen peroxide, and peracetic acid-based formulation
Medium Level	most pathogenic microorganisms and some viruses. They do not kill bacterial spores.	use on I.V. pumps, feeding pumps, etc. They are effective in killing such organisms as mycobacterium tuberculosis fungi, hepatitis B virus, medium and small size viruses.	chlorine compounds, alcohols (70 percent to 90 percent ethanol or isopropyl), and some phenolic and iodophor compounds
Low Level	some types of bacteria They generally have little effect on viruses and do not kill spores.	use in cleaning environmental surfaces, such as table tops, floors, and walls.	chlorine compounds (<u>bleach or Sodium Hypochlorite</u>), alcohols (70 percent to 90 percent ethanol or isopropyl), and Quaternary Ammonium Compounds

Collection and Transport Systems

One of SPD's primary functions is the collection of contaminated supplies and equipment. All contaminated supplies and equipment should be collected in covered conveyances or containers, such as waterproof plastic bags, tote-boxes with lids, or closed or covered carts.

All nursing units and clinic areas should have a dedicated soiled utility or "dirty" room. SPD will provide enclosed carts or containers in these rooms for the collection of all ward procedure trays and reusable devices. It is the user's responsibility to dispose of sharps appropriately and to remove or dispose of gross soil from items being returned to SPD.

Gloves must be changed after direct handling of contaminated items and between container drop-off sites. This will help reduce the chance of cross contamination between soiled pickup points and public conveyance (i.e., elevator buttons, door handles, telephones).

Take care to protect the environment when transporting contaminated items to SPD. Always cover contaminated items prior to transportation to SPD for decontamination. This prevents cross contamination to areas in the healthcare facility. There are several types of collection systems that can be used to transport items to the decontamination area:

Solid Containers

Solid containers provide an excellent barrier to cross contamination, as well as protection for the SPD technician. Containers should be light weight, durable, and made of material that can be properly decontaminated. The container should come with a lid that fits snugly over its opening. If the container does not have a lid, then it should be lined with a plastic bag. The bag must be sealed at the time of soiled pickup.

Carts

Carts used for soiled collection and transport should be:

- Easy to maneuver

- Easy to clean and decontaminate
- Made of metal or plastic
- Closed or covered with an impervious covering (A combination of a cart and a container is often used for soiled pickup.)
- Solid bottomed
- Dedicated for that purpose. (They may not be used for any other tasks.)

Carts require regular maintenance to keep them in peak working order. They should be cleaned daily or more often if needed. Cart wheels must be lubricated to ensure that they roll freely.

Specialty carts should be cleaned after use. Unused, single-use and disposable items must be removed from the specialty cart prior to taking it into the decontamination area for unloading and cleaning. If the items are taken into the decontamination area, they must be considered contaminated and discarded since they cannot be reprocessed.

When transporting large equipment such as emergency carts, warming blankets, etc., plastic bags are required if the item has come into contact with blood or body fluids.

Automated Transport Systems

An automated transport system consists of a series of enclosed carts, guide tracks, and dedicated elevators, enabling contaminated material to be picked up on a preprogrammed schedule. A technician programs the desired pickup points and intervals into the system. At the appointed times, the system retrieves the loaded carts and transports them to SPD for processing.

Types of systems available include monorails and robotic transport. The principle of operation for the two systems is similar. The robotic transport is the newer of the two systems. Components consist of an enclosed cart, guide track, programmable robot, and dedicated elevator(s). The technician can program the robot to retrieve a cart from a designated area. The robot travels to a

designated area, automatically loads the waiting cart, and automatically returns it to the SPD decontamination area. These systems lessen human exposure to contaminated materials and reduce the manpower required for collection.

Dedicated Lifts/Dumbwaiters

Dedicated lifts provide a direct route to SPD for contaminated materials. This simplifies the collection process and reduces the opportunities for cross contamination.

Carts and dumbwaiters must be designated as either clean or dirty—they are not interchangeable. Regular weekly cleaning and disinfection are necessary for proper infection control.

The Decontamination Process

Decontamination is the process performed to protect patients from the risk of infection caused by the use of reusable devices. The purpose of the Decontamination Area is to clean and disinfect all reusable supplies and equipment in order to reduce the bioburden. It is critical that all soil be removed and the surface treated with the appropriate disinfectant.

Items are collected from the user areas and transported to the decontamination area. As items are unloaded, they should be inspected to ensure that they are in good condition and that all parts are accounted for. If something is damaged or missing, you must record where the items came from and notify the user. Because of the number and variety of items used in the medical center, items should be sorted based on the processing method that they require.

The types of items to be cleaned include:

- a. Electrical equipment
- b. Non-electrical equipment
- c. Rubber/plastic supplies
- d. Surgical instruments

- e. Metalware
- f. Glassware
- g. Surgical power equipment
- h. Endoscopic equipment
- i. Other

Regardless of the instrument or equipment, the purpose of decontamination is the same; you want to remove substances that might harbor microbial life from the surface to reduce the bioburden. You reduce the bioburden as low as possible to allow for safe use and sterilization.

In general you do this by:

- Removing visible tissue or bone (gross soil)
- Cleaning the device, mechanically or by hand
- Applying the appropriate disinfectant
- Allowing the item to dry

The following are basic cleaning processes for each type of equipment.

Directions for Cleaning ELECTRICAL EQUIPMENT

Examples: infusion pumps, feeding pumps, K-pad motors, air compressors, portable suction machines, hypothermia units

1. Use a cleaning cloth saturated in disinfectant solution.
2. Start at the top and work down.
3. Wipe all exposed surfaces.
4. Use a brush to clean nooks and crannies.
5. Wipe the electrical cord; inspect it for damage; coil it up and secure it with a binder.
6. Wipe your work surface before turning the equipment over to work on the underside.
7. Wash casters and wheels last.



To prevent cross contamination, always rinse cloth in disinfectant solution between cleaning pieces of equipment.

Directions for Cleaning NON-ELECTRICAL EQUIPMENT

Examples: IV poles, wheelchairs, litters, K-pads, hypothermia blankets, seizure pads, foot cradles, commodes, isolation carts

1. Use a cleaning cloth saturated in disinfectant solution.
 2. Start at the top and work down.
 3. Wipe all exposed surfaces.
 4. Use a brush to clean nooks and crannies.
 5. Wipe the electrical cord; inspect it for damage; coil it up and secure it with a binder.
 6. Wipe your work surface before turning the equipment over to work on the underside.
 7. Wash casters and wheels last.
-

Directions for Cleaning RUBBER AND/OR PLASTIC SUPPLIES

Examples: nasal airways, oral airways, reusable ventilator tubing, reusable resuscitators, pulmonary tubing

1. Inspect each piece for tears, holes, or deterioration.
2. If using a washer/sterilizer, washer/sanitizer, or pasteurization machine, place items in the appropriate basket insert before starting cycle. Baskets are needed to correctly position the items to ensure that they get clean.
3. Pre-clean heavily soiled items prior to mechanical processing.
4. Use small brushes to clean inside tubes; rinse thoroughly.
5. Dry using compressed air, a tube drier, or allow to air-dry in the appropriate position.



Do not attempt to use the sonic cleaner for rubber or plastic items. They will absorb the sonic waves.

Directions for Cleaning SURGICAL INSTRUMENTS

Examples: forceps, hemostats, saw blades, scissors, retractors

1. Open or disassemble instrument.
2. Rinse the instrument with water and remove any gross soil. Inspect the teeth and grooves for tissues or bone fragments.
3. Remove debris by holding the instrument under the surface of the solution and scrubbing the area with an instrument brush.
4. Place the instruments in an ultrasonic cleaner, or hand wash items such as bone rasps and ronguers, if necessary. Process instruments in small batches to avoid tangling and damage. Handle instruments so that you avoid damage to the instrument or injury to yourself.
5. Pay particular attention to cannulated items or items with lumens. They may harbor blood and body tissue. Soak in hydrogen peroxide, if necessary, to loosen debris and use a small brush to ensure that all debris is removed.



Extreme care should be taken when handling sharp items. Scalpel blades, disposable needles, saw blades, and drill points should be disposed of by the operating room staff, but may be inadvertently overlooked.



Splashing is likely during this activity. Eye protection and a mask are required.



The type of instruments that will pass through SPD's decontamination area depends on the services offered at a medical center or clinic. Instruments are a costly investment; proper handling will extend the useful life of the investment. Handle them in small groups to avoid tangling and damage, and always place them in an open position to allow all areas to be exposed to the cleaning process. Needles should be separated and processed separately.



Use only nonabrasive cleansers to clean instruments because abrasive cleaners can damage the surface of the instrument, resulting in corrosion and rust. Instruments should be exposed to detergents that maintain a pH between 6.0 and 8.0. A neutral pH of 7.0 is ideal, since a high pH level (alkaline) or low pH level (acidic) may damage the surface of the instrument.

Directions for Cleaning METALWARE

Examples: bedpans, basins, medicine cups, instrument containers

1. Remove gross soil by manual washing.
2. Inspect items for damage.
3. Load items so that they will be correctly positioned during processing. Metalware with open depressions should be positioned open end down to facilitate drainage.
4. Use basket inserts to keep items from moving around during cleaning. Movement can damage the items, chamber, or spray arms.



If an item fills with water during processing, use extreme caution during removal. This represents a burn hazard, and protective gloves are required.

Directions for Cleaning GLASSWARE

Examples: syringes, medicine cups, elixir evacuator, straight and Y connectors, graduates

1. Disassemble component parts.
2. Inspect each item for cracks and chips.
3. Use appropriate brush and detergent to pre-clean lumens.
4. Needles must be soaked in hydrogen peroxide **first** and then processed.
5. Process in washer/sterilizer/sanitizer.
6. Remove items and inspect for damage.



Care must be taken when handling glassware. Broken glass can cause a serious wound to staff or patient.



Scrubbing must be done under the surface of the solution; eye protection is mandatory.

Directions for Cleaning SURGICAL POWER EQUIPMENT

Examples: drills, saws, reamers, mini drivers, compressed air/nitrogen powered equipment

1. Remove the hose and inspect for damage. Handpieces should be attached to the hose during cleaning to prevent solutions from entering the motor.
2. Wash the hose in a mild detergent. Do NOT use saline or a disinfectant solution.
3. Wipe off the hand piece with a mild detergent, followed by wiping down with a water-dampened cloth.



Although it is the user's responsibility to remove cutting blades or drill bits, this equipment may be returned with these items in place. This is especially hazardous if the unit is battery operated and the power source is in place. Serious injury can occur if power equipment is not handled properly.



Use care to avoid getting the cleaning solution or water inside the hand piece.

Directions for Cleaning ENDOSCOPIC EQUIPMENT

Examples:

Rigid endoscopes: arthroscopes, cystoscopes, bronchoscopes, laryngoscopes

Flexible endoscopes: sigmoidoscopes, colonoscopes, bronchoscopes, laparoscopes, cystoscopes

Rigid Endoscopes

To manually process a rigid endoscope:

1. Remove the fiber optic light cable from the scope.
2. Check the scope for damage, such as clouded lenses, bent instrument shaft, and burrs on the tip of the instrument shaft.
3. Remove the fiber optic light cable from the scope.
4. Wipe down scope, light cables, and adapters using appropriate cleaning solution.
5. Thoroughly rinse items by wiping down with a water-dampened cloth.
6. Careful attention should be paid to the lenses—they should be wiped with an alcohol-dampened swab/applicator.

7. Dry the scope thoroughly using a soft, lint-free cloth.



Before processing any scope, the technician should consult all manufacturer's instructions.



NEVER handle the scope by the shaft because it may cause damage.

Flexible Endoscopes

Flexible endoscopes can be used by a variety of services within the medical center, such as GI, Procto Clinic, Respiratory, Surgery, and ENT Clinic.

Manual processing:

1. Remove caps and/or valves on scope.
2. Using an enzyme solution, brush the channel(s) and flush until completely clean.
3. Hook up scope to leak tester to check integrity of the channel(s).
4. Inspect the outer casing of the scope.
5. If no damage is detected, process in a disinfecting solution. Scopes that are terminally sterilized in EtO do not need to be processed in a disinfecting solution, such as glutaraldehyde.
6. Rinse and dry. (Prior to storage all channels must be dry. Compressed air or 70% alcohol may be used to dry the channels.)
7. Test the scope to ensure that all features work properly.

Automated Cleaning/Disinfecting:

Follow the manufacturer's instructions for specific scopes and scope washers.

1. Manually clean the scope.
2. Select the appropriate adapter and attach it to the open channels. Selection of the correct adapter is critical.
3. Process scope, allowing cleaning solution to penetrate.
4. Rinse, dry and test as above.

After disinfecting, the scope is passed through to the preparation area for further processing.

Directions for Cleaning OTHER ITEMS

Examples: boovies, pacemaker cords, defibrillator paddles, EMG needles, EKG leads, rectal probes

General cleaning procedures are as follows:

- Inspect the outer case of the device for cracks, tears, or deterioration.
- Prepare a disinfectant solution, dampen cloth and wipe down casing. Do not immerse the device in the detergent solution or use disinfectant unless the manufacturer's instructions indicate to do so.
- Following cleaning, the device should be wiped off with a water-dampened cloth.
- Allow device to air-dry and then send it to the preparation room.



Microsurgical and delicate eye instruments

Delicate instruments should not be processed through a washer/sterilizer because the turbulent action of steam mixed with water may cause damage. They should be hand cleaned or processed through the ultrasonic in a protective cassette, rinsed, dried, and processed on a sterilize cycle only to ensure a decreased bioburden.

Mechanical Equipment

There are several types of equipment in the Decontamination area that are designed to help you process instruments and equipment. Each is designed to process a select group of instruments or equipment. The cleaning method you use will depend on the size and shape of an item, what it's made of, and how it's used, and the manufacturer recommendations.

Ultrasonic Cleaner



The Ultrasonic Cleaner is designed to clean surgical instrumentation using ultrasonic energy in a heated water-detergent solution. Instruments which appear clean after hand scrubbing may still retain particles and other soil in the box locks, serrations, or other difficult to clean areas.

The ultrasonic cleaner uses sound waves to vibrate the cleaning solution. Microscopic bubbles form on the instrument surface. As the bubbles implode they produce a vacuum area that dislodges minute particles of debris. This process is called cavitation. The cleaning solution used in the ultrasonic should be changed whenever visibly soiled or at least once or twice per shift. The number of solution changes is proportional to the number of sets processed.

Did you know?

The ultrasonic cleaning process is based on a fairly simple physical principle. Sound travels in waves that cause surrounding molecules to move back and forth in the direction of the wave. The higher the frequency, the faster the molecules move. In an ultrasonic cleaning chamber, the sound waves vibrate the cleaning solution with such intensity that the liquid molecules begin to pull apart. This produces air bubbles (much like boiling water) on the surface of the item being cleaned. When the bubble collapses it creates a void or cavity and surrounding molecules rush in to fill the space. This process is called **cavitation**.

Rubber and plastic items should not be used in the ultrasonic due to their tendency to absorb sound waves and defeat the process.

Utensil Washer



The Utensil Washer is designed to clean metalware, instrumentation, and glassware. In general, the cycle includes a wash and a rinse. Depending on the type of machine, other options such as pre-rinse and de-ionized or distilled water rinses may be available.

Only items designed for this unit should be processed in it. All items should be inspected following the cycle to ensure that they are clean.

Washer/Sanitizer



The Washer/Sanitizer is designed to wash and sanitize. For the sanitizing process, hot water or steam at atmospheric pressure is injected into the chamber to kill microorganisms on item surfaces. The washer/ sanitizer uses hot water at 60-95 degrees

Celsius. It thermally disinfects but does not sterilize. It is used for a

wide range of items that may deteriorate under the high temperature of the washer/sterilizer.

Sanitization is less effective in killing microorganisms than a washer/sterilizer.

Washer/Sterilizer



The Washer/Sterilizer uses saturated steam at a temperature range of 121-140 degrees Celsius. It is designed to clean and sterilize in four cycles: wash, rinse, sterilize, and exhaust.

It can process metalware, surgical instruments, and glassware. Ideally, demineralized or de-ionizer water should be used in the washer/sterilizer to prevent mineral buildup and chemical reactions associated with regular tap water. A drying cycle should be set to ensure the instruments will dry completely and not emerge into the prep room wet after the cycle.

Check monitoring displays throughout the cycles to ensure that the machine is functioning properly. A machine that does not perform up to standard will not properly process the load.

CAUTION!



Stainless steel instruments should not be processed close to instruments made of metals, such as non-anodized aluminums, brass, copper, or chrome plating. A reaction known as electrolysis may occur, resulting in one metal plating onto another. This reaction can result in permanent damage and staining.

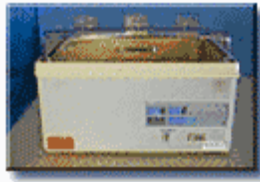
Pasteurmatic Washer



The pasteurmatic uses hot water at 170 degrees (76.7 degrees C) to clean and disinfect plastic/rubber tubing and similar items. The cycle lasts for 30 minutes. This process is not effective against spore-forming bacteria.

Scope Washer

The scope washer is a machine used to automatically clean and disinfect flexible endoscopes. Depending on the unit, there may be



several options which include wash only, disinfect only, or a combination.

The scope requires a few preparatory steps which include manual brushing of the channels, leak testing to assure that the scope has not been perforated during use and manual cleaning of the outside of the scope. Once these steps have been accomplished, the scope is placed in the washer and an adapter is attached to the appropriate channels of the scope. In general, a detergent solution is forced through the channels of the scope followed by a water rinse. A disinfectant is then injected into the channels and the scope is bathed in a disinfectant solution for a predetermined time. This is followed by a water rinse and drying cycle. Once the scope is removed from the washer, alcohol and air may be pulled through the channels to aid drying.

Before operating the unit, you should review the manufacturer's operating instructions.

Cart Washer



The cart washer, as the name implies, is used to clean items such as carts, wheel chairs, litters/stretchers, and metal pan ware. The cycle consists of a water/detergent phase followed by a water rinse. Cart washers can also be equipped with drying vents or a separate drying chamber.

Steam Cleaning Device



The steam cleaning device (commonly called a steam gun) is a handheld device used for sanitizing items such as wheelchairs, litters, and carts. Steam cleaning devices can come equipped with detergent dispensers and water rinse options.



CAUTION!

Use caution when using this device. Splashing or burns may occur if personal protective equipment is not used.

Tube Dryer



The Tube Dryer is used to dry plastic or rubber goods following cleaning and disinfection. The unit draws in air and heats it. The hot air is then circulated into the cabinet. This facilitates drying the load. Following the cycle, you must check the items to ensure they are completely dry. Items that are not dried correctly may interfere with further thermal or EtO sterilization.

As an SPD technician, you are faced with the task of cleaning and disinfecting a wide variety of instruments and equipment. It is critical that you become familiar with them and follow manufacturer's directions for cleaning and disinfecting them. Procedures for cleaning equipment are kept on file within SPD. You are responsible for knowing where they are and using them whenever you have questions or are unsure. By applying the appropriate cleaning process and using disinfectants correctly, you prevent cross contamination and accomplish the most critical step in the infection control process.

Remember...



This equipment is expensive and some of it is very delicate. Improper cleaning can render it useless and may affect patient care.

Infection Control

Universal Precaution/Standards should be strictly followed in the decontamination area. It is your responsibility to be familiar with the policies and procedures that govern your work area. The following guidelines are critical in controlling the spread of infection.

- Wear Personal Protective Equipment.
- Use proper hand washing technique.
- Follow procedure for handling spills and soiled material.
- Practice safe handling of sharps.
- Clean all environmental surfaces on a regular basis.

Personal Protective Equipment

PPE was discussed earlier in this module. It helps to protect you, the environment, and the patients and visitors in the medical center.

Hand Washing

Hand washing is the single most important step in preventing cross contamination. You should wash your hands before and after every task, including:

- Before starting work
- Before and after meals or breaks
- After using the bathroom
- After handling soiled items
- Before entering clean areas to handle clean items
- Before going off duty
- Immediately following unanticipated contact with body fluids or chemicals

Spills

After a disinfectant is used to clean where infectious material has been spilled or sprayed, the affected area must be allowed to air dry. In the case where a large volume of potentially hazardous material has been spilled, your supervisor and Environmental Management Service should be contacted and appropriate steps taken to reduce further contact to co-workers (wet floor signs, etc.).

Soiled Materials

Reusable materials, such as towels, instruments, and equipment, which have come in contact with body fluids, should be handled as little as possible. Place materials in an appropriate moisture-resistant laundry bag and carry them to the proper location for cleaning and decontamination. Be sure to wear personal protective clothing while handling them.

All body fluids and disposable items visibly contaminated with body fluids should be discarded as infectious waste. Infectious waste is any substance deemed to be potentially harmful to personnel or the environment by way of cross contamination.

Impervious disposal containers with secure fitting lids should be provided in the decontamination area. Containers should be emptied and disinfected regularly by Environmental Management Service.

Safe Handling of Sharps

Sharps are defined as: needles, scalpel blades, and other sharp objects that can penetrate the skin. Safe use includes:

- Inspecting procedure trays carefully for sharps that have not been disposed at point of use.
- Immediate disposal in a puncture-resistant container
- Using forceps to remove a scalpel blade from a reusable handle
- Never picking up broken glassware with your hands
- Never putting your hands in a sharps container to retrieve items
- Never placing sharps in uniform pockets or using them for other purposes such as opening boxes or removing tape.

Environmental Cleaning

Environmental Management Service is responsible for cleaning the floors and walls of the decontamination area. SPD technicians are responsible for cleaning all work surfaces and sinks at the end of each shift and as needed.

Safety

The SPD Policy and Procedures Manual provides safety related guidelines for technicians to follow. It is the technician's responsibility to know and observe safety rules.

Material Safety Data Sheets (MSDS) are documents (prepared by the manufacturers of chemical products) provided to users so they understand the safe use of the products. The MSDS usually consist of 8 to 10 sections of information regarding health hazards, emergency procedures, precautionary measures, and first aid techniques. SPD must have a copy of the MSDS for each chemical

that is used. You must review the MSDS before handling any potentially hazardous chemicals.

Eye Wash Stations are used for emergency eye flush in the case of a chemical splash in the eye. You must be knowledgeable in how and when to use this equipment.

Hazards

SPD staff should follow all safety procedures in the performance of their job duties. Proper body mechanics should be used when lifting or bending is required. Any injuries, unsafe conditions, or practices should be reported immediately to supervisory personnel. Some of the areas of potential safety hazards in the decontamination area include:

1. Open drawers.
2. Sharps and needle sticks.
3. Carelessly stacked washer/sterilizer baskets.
4. Automatic cart washer doors.
5. Lifting heavy objects.
6. Slippery wet floors.
7. Automatic loaders/unloaders and doors of washer sterilizers.
8. Hot items.
9. Improper use of chemicals.
10. Equipment noise.

Summary

Decontamination is the first and most critical step in the process of making medical devices germ free. It is dirty, time-consuming, repetitive work that is absolutely essential to the infection control process. The nature of the work demands that the technician perform, without error, in an uncomfortable, hazardous environment, often under time constraints. The decontamination tasks require knowledge of procedures, operation of multiple types of equipment, and attention to detail.

✓ Check What You Know

1. The purpose of decontamination is to: _____
 - a. Protect workers
 - b. Ensure the sterility of surgical devices
 - c. Reduce the bioburden on reusable devices
 - d. Facilitate cross contamination

2. Match each term to its description.

a. Low-level disinfectant	___	Aids removal of soil such as blood, pus, and urine
b. Detergent	___	A measure of the acidity or alkalinity of a substance
c. High-level disinfectant	___	Appropriate for items that will come in contact with body tissues or fluids or mucous membranes
d. pH level	___	Used for cleaning environmental surfaces such as walls and floors
e. Medium-level disinfectant	___	Kills most pathogenic microorganisms and some viruses

3. Match each term to the correct statement.

a. Solid containers	___	Wheels require routine lubrication
b. Carts	___	Must have a tight fitting lid
c. Dumbwaiters	___	Requires programming by a technician
d. Automated Transport	___	Must be designated as either clean or dirty

4. Which statements are true regarding the collection of contaminated items?
- ☐ a. PPE consists of gloves and a head covering.
 - ☐ b. Containers must be made of disposable material.
 - ☐ c. Is done on an “as-needed” basis.
 - ☐ d. Must be done in a manner that protects the technician, the environment, and the public.
5. Which of the following can be processed in a washer/sterilizer? _____
- a. Flexible endoscope
 - b. Metalware
 - c. Surgical power equipment
 - d. Glassware
6. Order the steps for decontaminating surgical instruments.
- ☐ a. Place on trays or washer racks in open position.
 - ☐ b. Remove gross soil.
 - ☐ c. Process in ultrasonic cleaner.
 - ☐ d. Send to prep room.
7. Order the steps for decontaminating power tools.
- ☐ a. Remove bits or blades.
 - ☐ b. Wipe hand piece with water-dampened cloth.
 - ☐ c. Remove power source.
 - ☐ d. Clean hand piece with cleaning solution.
8. Which statements that are true regarding sharps?
- ☐ a. Disposable sharps should be disposed of at the point of use.
 - ☐ b. Sharps are not a concern for SPD. They are disposed of by the user.
 - ☐ c. Sharps must be disposed of in special containers.
 - ☐ d. Sharps generally are reusable and must be reprocessed with care.

Terminology

The following terms were used in this module.

bioburden	The amount of contaminants on a surface.
bacteria	A group of round-, spiral- or rod-shaped single-celled organisms.
cannulated	Having a small tube designed to be inserted into a body cavity, duct, or vessel.
cavitation	The principle of action upon which ultrasonic cleaning is based.
contaminated material	Material that has come into contact with blood or other body fluids and may harbor infectious microorganisms.
electrolysis	The producing of chemical changes by the passing of an electrical current through a substance.
fungi	A parasitic spore-producing organism that lacks chlorophyll, including molds and yeasts.
germicide	An agent that destroys or kills germs.
gross soil	A concentration of organic matter such as pieces of tissue or bone adhering to surgical instruments or medical equipment in sufficient quantities to contaminate the environment. Blood is not considered to be gross soil.
impervious	Able to prevent the passage of fluids.
infection control	A process designed to interrupt the chain of infection by reducing the opportunities for transfer of pathogenic microorganisms from one host to another.
lumen	The cavity of a tubular organ, the bore of a tube, such as a catheter.

microorganism	A living being of microscopic size.
Pasteurmatic	Uses hot water at 170 degrees F for 30 minutes to clean plastic and rubber tubing.
Personal Protective Equipment (PPE)	Attire that is designed to keep workers safe from environmental hazards; PPE may vary according to the work assignment.
pH level	A measure of how acidic or alkaline a substance is—neutral pH equals 7 on a 0-14 scale.
point-of-use	The location where an instrument or device is used for its intended purpose. For example, the operating room would be the point-of-use for surgical instruments.
sharps	Needles or other sharp instruments that must be handled with caution and disposed of properly.
specialty carts	Carts stocked with supplies designated for a specific procedure or activity.
Ultrasonic Cleaner	Device that uses sound waves to remove particles from objects in a water bath through a process called cavitation.
Universal Precaution/ Standards	The practice of Universal Precaution/Standards is to be followed by all healthcare workers whose functions could bring them into contact with blood, body fluids, or body substances. All of the precautions mandate that all contaminated items are treated as if they are known to be infectious. Precautions also include frequent hand washing and the use of PPE.
virus	A submicroscopic organism that can only live and grow in a living cell; the causative agent in an infectious disease.
Steam Cleaner	Handheld device used for cleaning wheelchairs and carts.

Tube Dryer	Used to dry rubber or plastic goods following cleaning, this device draws in air, heats it, and circulates it through the cabinet.
Washer/Sterilizer	Good for cleaning metalware, surgical instruments, and glassware. Uses steam under pressure to render items sterile.
Washer/Sanitizer	Uses steam to thermally sanitize items. Considered less effective than the Washer/Sterilizer.
Ultrasonic Cleaner	Uses sound waves and a process called cavitation to remove soil particles.
Scope Washer	Requires an adapter to force cleaning solution through the channels of flexible scopes.